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# GROWTH OF PONDEROSA PINE ON BEST SITES

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Fertile bottom lands in the vicinity of Tensed, Benewah County, Idaho, have produced over 1,000 board feet of ponderosa pine timber per acre per year during the past 17 years. One area produced over 2,000 board feet per acre per year. Such rapid growth occurs only on excellent sites in fully stocked stands and is not typical of most timberland. Nearly all lands of similar fertility have been cleared for agriculture and produce excellent hay and grain crops. However, the following growth figures, though of limited application, do show the upper limit of growth potential on ponderosa pine sites in the northern Rocky Mountain region. The volume growth was measured on selected fifth-acre plots which were established in 1934 in 55- to 67-year-old stands as a part of a normal yield study of second-growth ponderosa pine.1/ Of the 20 plots established in northern Idaho, only 4 were undisturbed by 1951. Two of the 4 had been burned over at least once by ground fires during the 17-year period.

Table 1 gives the number of trees, basal area, cubic volume, and board-foot volume per acre for both the 1934 and 1951 measurements. Plot 6, located on a site quality II2/, showed a net increase of 12,652 board feet per acre or an annual net growth of 744 board feet. Plot 9, located on a site I2/, produced a net increment of 38,462 board feet per acre, or a yearly growth of 2,262 board feet. The four plots averaged 1,305 board feet per acre per year.

The plots were overstocked in terms of basal area in 1934 and again in 1951 (table 2). Three of the 4 plots approached normal stocking during the 17-year period, but plot 9, the most heavily stocked of all, showed a reverse trend. This undoubtedly accounts for its exceptionally high yield.

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1/ Meyer, W. H. Yield of even-aged stands of ponderosa pine. USDA Tech. Bul. No. 630. 60 pp. Illus. 1938.

2/ The height of average-diameter dominant and codominant trees must be at least 99 feet at age 100 years for site quality II, and 113 feet at age 100 years for site I.

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Table 1. Numbers of trees, basal areas, cubic volumes, and board-foot volumes per acre for four northern Idaho ponderosa pine growth plots measured in 1934 and again in 1951

| Plot Number | Number of trees 1/ | | | Basal area 1/ | | | Cubic volume 1/ | | | Scribner volume 2/ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1934 | 1951 | Change | 1934 | 1951 | Change | 1934 | 1951 | Growth | 1934 | 1951 | Growth |
| | No. | No. | No. | Sq.ft. | Sq.ft. | Sq.ft. | Cu.ft. | Cu.ft. | Cu.ft. | Bd.ft. | Bd.ft. | Bd.ft. |
| 6 | 320 | 235 | -85 | 318 | 315 | -3 | 9,698 | 10,954 | 1,256 | 38,463 | 51,115 | 12,652 |
| 8 | 424 | 232 | -192 | 305 | 266 | -39 | 8,745 | 10,027 | 1,282 | 28,842 | 45,672 | 16,830 |
| 9 | 380 | 230 | -150 | 367 | 405 | +38 | 11,278 | 16,672 | 5,394 | 48,638 | 87,100 | 38,462 |
| 13 | 420 | 240 | -180 | 289 | 276 | -13 | 7,975 | 10,190 | 2,215 | 25,071 | 45,854 | 20,783 |
| Average | 386 | 234 | -152 | 320 | 316 | -4 | 9,424 | 11,961 | 2,537 | 35,254 | 57,435 | 22,182 |

1/ Trees 0.6 inches d.b.h. and larger.
2/ Trees 9.6 inches d.b.h. and larger.

Table 2. Site index, site quality, age, and normality of four northern Idaho ponderosa pine growth plots

| Plot number | Site index 1/ | Site quality | Stand age in 1934 | Basal area normality 2/ | | |
|---|---|---|---|---|---|---|
| | | | | 1934 | 1951 | Change |
| | | | Years | Percent | Percent | Percent |
| 6 | 106 | II | 67 | 134 | 133 | -1 |
| 8 | 121 | I | 55 | 118 | 102 | -16 |
| 9 | 126 | I | 56 | 138 | 152 | +14 |
| 13 | 112 | II | 59 | 117 | 112 | -5 |

1/ Height in feet of average-diameter dominant and codominant trees at age 100 years.
2/ From Meyer.

Mortality during the 17-year period averaged 152 trees per acre for the 4 plots, showing that a large volume was lost by suppression in these overdense, unmanaged stands. Plot 9, although gaining in basal area, lost 150 trees per acre during the period.

The quality of timber produced by these young, fast-growing stands is not high. Limbs are generally larger than normal because of the rank, vigorous growth and, of course, are slow to shed (figure 1). Such stands should be pruned when young and thinned lightly at frequent intervals to realize maximum volume and value yields.

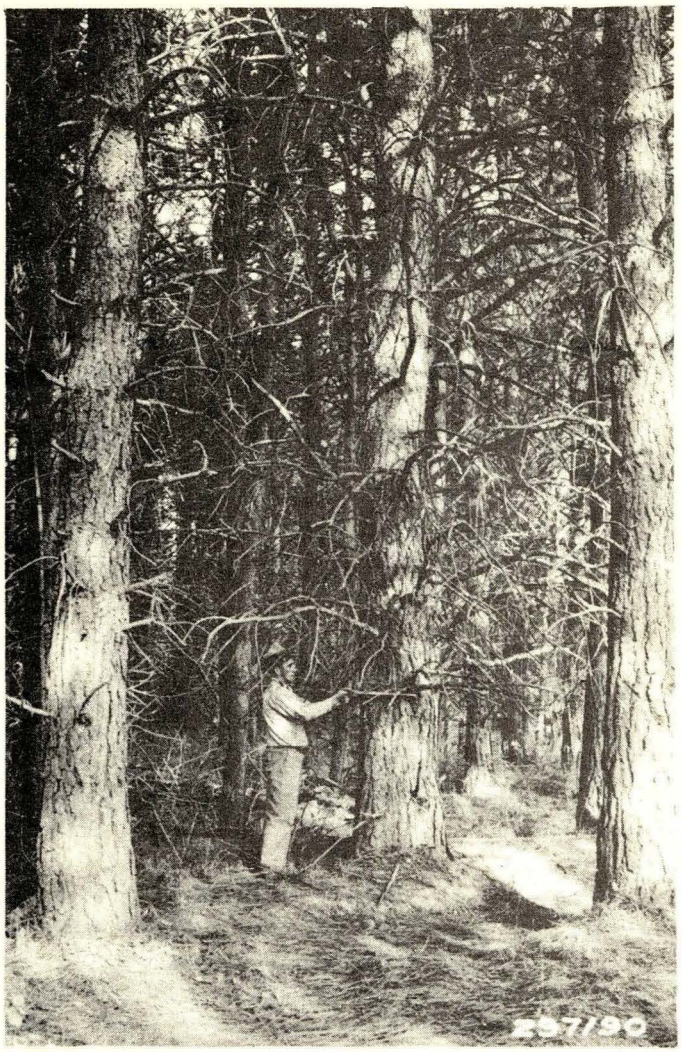

Figure 1. Plot 9 in 1934 showing a dense stand of 56-year-old ponderosa pine